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**SYSTEMS, METHODS AND KITS TO FACILITATE THE SOLUTION OF  
DIAGRAMLESS CROSSWORD PUZZLES**

**CROSS-REFERENCE TO RELATED APPLICATIONS**

The present application claims the benefit of and priority to U.S. Provisional  
Application No. 60/456,267, filed on March 20, 2003, the entire content of which is  
10 incorporated herein by reference.

**BACKGROUND**

1. Technical Field

The present disclosure relates generally to diagramless crossword puzzles, and  
15 more particularly, to systems, methods, and kits for facilitating the solving and/or  
resolution of diagramless crossword puzzles.

2. Background of Related Art

Generally, diagramless crosswords are those which the “Across” and “Down”  
20 clues are given. However, unlike regular crosswords, in diagramless crossword puzzles,  
the actual diagram of the puzzle (i.e., the numbered grid with certain of the cells blacked)  
is not provided. Only the number of cells comprising the height and width of the grid are  
disclosed. Occasionally, the location of the starting cell is disclosed.

Accordingly, unlike regular crosswords, diagramless crosswords require the participant to not only answer the clues, but to turn the entirely featureless grid into a regular crossword grid by figuring out where the black cells are located and marking them as such, and to figuring out where all the clue numbers go in the cells of the crossword grid. Typically, for all but the first “Across” clue, one needs to guess how long the answer is.

In solving a diagramless crossword puzzle, the following tips have been offered. First, the length of the first Across answer is determined. The length of the first Across answer is determined by subtracting one (1) from the number of the second Across clue. For example, if the second Across clue is numbered “6”, then the answer to the 1-Across clue is five (5) letters long.

Then try to write in the answer to 1-Across, which would provide the starting letters for the 1-Down, 2-Down, 3-Down, 4-Down and 5-Down answers. Remember, the cell of the grid at the beginning and at the end of each answer should be blackened.

Often, American crosswords have mirror symmetry (i.e., the pattern of black and white squares in the puzzle look the same if the grid is turned upside down). There are other variations of the symmetry of the diagram, for example, left- right or up-down symmetry. Indeed, in some rare instances, the diagram may be slightly asymmetrical.

It is this very manipulation of usable information that makes the invention of the present disclosure so useful in achieving the intellectual satisfaction in the successful solution of these puzzles.

In view of the foregoing, a continuing need exists for devices and methods for facilitating the resolution of diagramless crossword puzzles.

## **SUMMARY**

The present disclosure relates to systems, methods and kits for solving diagramless crossword puzzles.

5           According to an embodiment of the present disclosure, a system for completing a diagramless crossword puzzle having a solution grid defining a rectilinear array of cells, is provided. Preferably, the number of its cells is greater than the maximum number of cells that the final diagram may ultimately occupy. The completion system includes a plurality of overlays each having a first and a second surface, of the same horizontal and  
10   vertical pitch as those of the solution grid. Each overlay includes a grid formed on the first surface thereof. The grid of each overlay defines an array of cells. Accordingly, the overlays are selectively placable on a surface of the solution grid such that the array of cells of the overlay correspond with the rectilinear array of cells of the solution grid. Typically, these overlays may contain approximately six to eight squares extending in  
15   both a vertical and a horizontal direction.

Each overlay may be fabricated from a flexible sheet material. The flexible sheet material may be a paper-based material and/or a plastic film-based material. Preferably, each overlay includes a coating of a selectively repositionable adhesive medium provided on at least a portion of the second surface thereof. The adhesive medium is at least one  
20   of acrylate co-polymers, silicone materials, urethanes, and fluoro polymers.

In one embodiment, a plurality of overlays may be operatively joined to one another in a sheet of overlays. As such, a plurality of sheets of overlays may be

operatively joined to one another in a stack. Each overlay of each sheet is preferably separated from one another by a line of perforations.

The system may further include at least one solution grid having a rectilinear array of cells. The system may further include a set of instructions for using the completion system. The system may further include at least one set of clues for completing a diagramless crossword puzzle.

According to another aspect of the disclosure, a method of solving a diagramless crossword puzzle, is provided. The method includes the step of providing a diagramless crossword puzzle completion system. The completion system includes at least a plurality of overlays each having a first and a second surface. Each overlay includes a grid formed on the first surface thereof. The grid of each overlay defines an array of cells, wherein the overlays are selectively placable on a surface of the solution grid such that the array of cells of the overlay correspond with the rectilinear array of cells of the solution grid.

The method further includes the steps of identifying corner cells of the diagramless crossword puzzle; placing a first overlay on a solution grid; beginning resolution of a portion of the puzzle on the first overlay; marking each cell immediately adjacent to a cell corresponding to the final letter of each Across answer and each Down answer; beginning resolution of other portions of the puzzle on other overlays; and arranging the overlays to resolve the diagram of the puzzle.

The method further includes the steps of determining a length of a first Across answer; numbering the cells to the right from an upper left-most cell from the number one up to the number of the length of the first Across answer; and marking a cell to the right of the cell corresponding to the final cell for the first Across answer.

The method further includes the steps of placing another overlay on the first overlay; transposing the marked cells of the first overlay to the another overlay; rotating the another overlay by 180°; and placing the another overlay on a lower right-most portion of the solution grid.

5           The method may further include the step of determining the size of a solution grid for the puzzle. The step of identifying the corner cells includes marking Across clues and Down clues, sharing a common clue number, with identifying indicia. The step of beginning resolution of the puzzle includes determining answers for the Across clues and the Down clues.

10           The step of determining the length of the first Across answer includes subtracting one from the number of a second Across clue. The method may further include the step of determining a length of a second Across answer. Determination of the length of the second Across answer includes subtracting the length of the first Across answer from the number of a third Across clue.

15           The method further includes the step of placing overlays on at least an upper-half portion of the solution grid; resolving the puzzle on the overlays placed on at least the upper-half portion of the solution grid; placing additional overlays on the overlays covering at least the upper-half portion of the solution grid; and transposing any marked cells from the overlays covering at least the upper-half portion of the solution grid to the  
20 additional overlays.

The method further includes the steps of rotating the additional overlays; and placing the additional overlays on a lower-half portion of the solution grid.

The step of providing the completion system further includes providing at least one solution grid having a rectilinear array of cells and/or providing a set of instructions for using the completion system.

5 Preferably, the overlays lay one atop at least a portion of another. Desirably, the placing of the first overlay on the solution grid includes placing an upper left-most cell of the overlay on a cell of the solution grid located in an upper row of the solution grid and on a cell of the solution grid located to the right of a left-most column of the solution grid.

10 The method further includes the steps involved in the use of the overlays. One method would be to use a separate overlay for each highlighted Corner square, which are those squares having a common numbered clue in both the Across and Down directions. The method further includes the step of filling in as many of the answers as can be reasonably guessed at.

15 The method further includes the step of positioning the overlays on the solution grid, wherein at first the only definite clue is that the overlay containing square number one should be positioned at the top of the solution grid, somewhere to the left thereof, preferably at the center thereof.

20 The method further includes the step of exercising the puzzle solver's acumen in observing the flow of letters in the already-solved words or word segments, and superimposing the overlays as required to form the intelligible words. It is at this point that surmising the type of symmetry the puzzle may possess.

A kit for completing a diagramless crossword puzzle is also provided. The kit includes at least one solution grid defining a rectilinear array of cells; and a plurality of

overlays. Each overlay has a first and a second surface with a grid formed on the first surface thereof. The grid of each overlay may define an array of cells. The overlays may be placed on a surface of the solution grid such that the array of cells of the overlay correspond with the rectilinear array of cells of the solution grid. Desirably, each overlay  
5 may include a coating of a selectively repositionable adhesive medium provided on at least a portion of the second surface thereof.

The kit may further include instructions for using the plurality of overlays to resolve a diagramless crossword puzzle. The kit further includes a booklet of clues.

These and other features of the disclosure will become more clearly illustrated  
10 below by the description of the drawings and the detailed description of the preferred embodiments.

### **BRIEF DESCRIPTION OF THE DRAWINGS**

The accompanying drawings, which are incorporated in and constitute a part of  
15 the specification, illustrate embodiments of the invention, and together with a general description of the invention given above, and the detailed description of the embodiments given below, serve to explain the principles of the invention.

FIG. 1 is a plan view of an exemplary solution grid for a diagramless crossword puzzle;

20 FIG. 2 is a perspective view of a stack of overlays for placement on the solution grid of FIG. 1;

FIG. 2A is a perspective view of a stack of overlays, according to another embodiment of the present disclosure, for placement on the solution grid of FIG. 1;

FIG. 3 is an exemplary set of clues for use in resolving the diagramless crossword puzzle;

FIG. 4 is a flow chart illustrating a method, in accordance with the present disclosure, for resolving the diagramless crossword puzzle with the exemplary clues of  
5 FIG. 3;

FIG. 5 depicts the first step of the method of FIG. 4;

FIG. 6 is a plan view of an overlay of the stack of overlays of FIG. 2, depicting another step of the method of FIG. 4;

FIG. 7 is a plan view of the overlay of FIG. 6, depicting another step of the  
10 method of FIG. 4;

FIG. 8 is a perspective view of the solution grid of FIG. 7, illustrating the placement of the overlay of FIGS. 6 and 7 on the solution grid of FIG. 1, according to a method of the present disclosure;

FIG. 9 is a perspective view of the solution grid of FIG. 8, illustrating an  
15 alternative placement of the overlay of FIGS. 6 and 7 on the solution grid of FIG. 1;

FIG. 10 is an enlarged perspective view of the area indicated as "10" of FIG. 9;

FIG. 11 is a perspective view of the solution grid of FIG. 10, illustrating another step in the method of the present disclosure;

FIG. 12 is a plan view of the solution grid of FIG. 11 illustrating yet another step  
20 in the method of the present disclosure;

FIG. 13 is a plan view of the solution grid of FIG. 12 illustrating still another step in the method of the present disclosure; and



FIG. 14 is a schematic illustration of a completion system according to another embodiment of the present disclosure.

### **DETAILED DESCRIPTION**

5           With reference to FIGS. 1-13, there is shown a system for completing a diagramless crossword puzzle, generally designated as 100, and a method for using system 100 to allow a user to solve and/or complete a diagramless crossword.

Completion system 100 may include a solution grid 102 (see FIG. 1) on which the diagramless crossword puzzle is to be completed. Solution grid 102 includes an array of  
10   cells defined by a row or plurality of cells  $A_N$  extending across solution grid 102 and a column or plurality of cells  $D_N$  extending down solution grid 102. While solution grid 102 is shown as having a different number of across cells  $A_N$  and down cells  $D_N$ , forming a rectangular solution grid, it is contemplated that solution grid 102 may include the same number of across cells  $A_N$  and down cells  $D_N$ , forming a square solution grid. Each cell  
15   of solution grid 102 preferably has a uniform height and width.

As seen in FIG. 2, completion system 100 includes a plurality of stickers or overlays 110. Preferably, overlays 110 are provided in a stack 112 of sheets 114. It is envisioned that each sheet 114 is perforated or provided with a tear line 116 formed between adjacent overlays 110. Each overlay 110 includes a grid 120 formed on a first  
20   surface thereof defining an array of cells 122. Preferably, cells 122 of overlay 110 are sized and/or dimensioned (i.e., have a height and a width) to substantially correspond to the size and/or dimension (i.e., height and width) of cells  $A_N$ ,  $D_N$  of solution grid 102.

Desirably, each overlay 110 includes a coating 124 of a selectively reusable and/or repositionable adhesive medium (e.g., low adhesion backsize) provided on at least a portion of a second surface thereof (i.e., a surface opposite the first surface) such that each overlay 110 is selectively repositionable. Each overlay may be fabricated from a flexible sheet material including and not limited to paper-based (e.g., paper, cardboard, etc.) and plastic film-based materials (e.g., polyethylene, polypropylene and polyester). Use of a plastic film-based material has the advantage that overlays 110 may be reusable (i.e., the marking formed thereon during use may be erased and/or wiped off). Moreover, it is envisioned that each overlay 110 is fabricated from a material which may be written on by pen, pencil, grease pencil, marker and/or crayon.

The adhesive medium or low adhesion backsize (LAB) material may be any suitable material including, but not limited to, acrylate co-polymers, silicone materials, urethanes, and fluoro-polymers. For example, the LAB material may be a water-based solution of the material described in EP-A-0618509, the entire contents of which are incorporated herein by reference, the solution comprising typically from about 5% to about 10% solid material. Other LAB materials that may be employed include those disclosed in U.S. Pat. Nos. 5,202,190 and 5,032,460, the entire contents of each of which being incorporated herein by reference. Preferably, the adhesive medium is a repositionable microsphere pressure-sensitive adhesive, for example as described in U.S. Pat. Nos. 5,045,569; 4,495,318; 4,166,152; 3,857,731; 3,691,140; U.S. Pat. No. Re 24906; U.S. Pat. No. 5,571,617 and EP-A-0439,941, the entire contents of each of which being incorporated herein by reference.

As seen in FIG. 2A, an alternate embodiment for the stack of overlays is shown as stack 112a. Stack 112a of overlays 110 includes a plurality of individual sheets 114 including 6 to 8 cells 122 extending in both the Across and Down directions.

Completion system 100 may be used to complete a diagramless crossword puzzle having clues “C” as shown in FIG. 3. Clues “C” of FIG. 3 are merely exemplary and are not intended to in any way limit the scope of the present disclosure. Clues “C” of FIG. 3 are intended to be used in connection with a diagramless crossword puzzle having a seventeen cell wide and a seventeen cell high solution grid.

With particular reference to FIGS. 4-13, a method of using completion system 100 to solve a diagramless puzzle, is shown and described. As seen in FIG. 4, a flow chart illustrating an exemplary method of solving a diagramless crossword puzzle, having, for example, the clues of FIG. 3, is shown.

The method includes the steps of providing a completion system 100 including a plurality of or stack 112 of stickers or overlays 110. The method may further include the step of providing a solution grid 102. While the method may include the step of providing a solution grid 102, it is envisioned that the method according to the present disclosure may be performed in connection with a solution grid provided together with clues “C” of the diagramless crossword puzzle.

Initially, if a solution grid is not provided with clues “C” of the diagramless crossword puzzle, the method may further include the step of determining and/or ascertaining the size of solution grid 102 required and delineating the overall size of solution grid 102.

Alternatively, if a solution grid 102 is provided, the method initially requires identification of corner cells 130 of solution grid 102. Corner cells 130 are cells of solution grid 102 which share a common clue number “C<sub>C</sub>” (i.e., the number of the across clue is the same as the number of the down clue). Identification of corner cells 130 requires marking of the across “C<sub>A</sub>” and the down clues “C<sub>D</sub>”, sharing the common clue number “C<sub>C</sub>”, with an identifying feature and/or characteristic. For example, as seen in FIG. 5, the across and down clues “C<sub>A</sub>, C<sub>D</sub>” having common clue numbers “C<sub>C</sub>” (i.e., clues 1, 6, 12, 30, 33, 39, 44, 46, 48, 50, 51, 53, 56, 59 and 68) have been bolded. However, it is envisioned and within the scope of the present disclosure, to mark common clues “C<sub>C</sub>” by any discernable method, such as, for example, by at least one highlighting, underlining, circling, asterisking, etc.

With corner cells 130 identified, it is then known that the cells immediately above and the cells immediately to the left of corner cells 130 are blank and may be filled in or blackened. Additionally, a numbered cell that is Across only must have at least one blank square which is immediately to the left thereof. The numbered cell that is Across only typically identifies at least one open cell above it, which at least one open cell above is part of a Down answer or word whose beginning is somewhere above this open cell. Likewise, a numbered cell that is Down only, must have at least one blank square which is immediately above it. The numbered cell that is Down only typically identifies at least one open cell to its left, which at least one open cell to the left is part of an Across answer or word whose beginning is somewhere to the left of this open cell.

By highlighting all of the clue numbers, i.e., common clues “C<sub>C</sub>” or “corner” squares, that appear in both the Across clues “C<sub>A</sub>” and the Down clues “C<sub>D</sub>”, and

realizing that the squares immediately above and immediately to the left of these “corner” squares must necessarily be blank, one gains some insight as to the puzzle’s final configuration.

As described above, further insight is gained from the realization that a numbered square that is Across only must have a blank square immediately to its left, but NOT above it, and that this square contains a letter that is part of a Down word whose beginning is somewhere above. Similarly, a numbered square that is Down only must have a blank square above it, and must contain a letter that is part of an Across word whose beginning is somewhere to its left.

The method next requires determination of the length of the first Across answer. The length of the first Across answer is determined by subtracting one (1) from the number of the second Across clue. For example, as seen from FIG. 5, if the second Across clue is numbered “6”, then the length of the first Across answer is five (5) cells long (e.g., six minus one).

As seen in FIG. 6, the cells extending across a first overlay 110a are then numbered consecutively from one (1) to five (5), i.e., the length of the first Across answer. Next, cell 126a of first overlay 110a, immediately to the right of the cell which is to contain the last character of the first Across answer, is marked (e.g., filled in or blackened). For instance, from the example given above, as seen in FIG. 6, cell 126a of first overlay 110a, immediately to the right of the cell marked with the numeral “5” is blackened.

Turning now to FIG. 7, resolution of the first Across answer as well as Down answers one through five is attempted. As seen in FIG. 7, these answers are resolved and

may be filled in. As Down answers one through five are resolved, the cell immediately below the last letter of the Down answer is blackened. These blackened cells are identified as 128a, 130a, 132a and 134a.

Next, as seen in FIG. 8, first overlay 110a is placed on solution grid 102.

- 5 Preferably, first overlay 110a is placed on solution grid 102 such that upper left-most cell 130a (i.e., the cell of overlay 110a numbered "1") is placed on solution grid 102 to overlie a cell 130 of solution grid 102 which is in the upper-most row of cells of solution grid 102 and at a location to the right of the left-most column of cells of solution grid 102, preferably at or near the center-most cell in the upper-most row of cells of solution  
10 grid 102.

Adhesive coating 124 inhibits accidental or inadvertent movement or removal of first overlay 110a from solution grid 102.

- During resolution of the diagramless crossword puzzle, as seen in FIGS. 9-13, overlay 110a may be placed on solution grid 102 such that cell 112a of overlay 110a is  
15 positioned over the upper left-most cell 132 of solution grid 102. For instance, if, during the resolution of the diagramless crossword puzzle, it is determined that overlay 110a is placed too far to the right on solution grid 102, overlay 110a may be moved to the left on solution grid 102, along the upper-most row of cells. In an alternative method, overlay 110a may be placed on solution grid 102 such that cell 112a of overlay is positioned over  
20 the upper left-most cell 132 of solution grid 102 from the beginning.

Next, additional overlays are placed on solution grid 102 and/or on overlay 110a in order to complete other portions of the diagramless crossword puzzle. For example, as seen in FIGS. 11-13, additional overlays 110b, 110c, etc. may be placed on solution grid

102 to thereby entirely cover an upper half portion of solution grid 102. Preferably, overlays 110a, 110b, 110c are placed on solution grid 102 such that overlays 110a, 110b, 110c overlap one another by at least on cell width. However, it is envisioned that overlays 110a, 110b, 110c, may be placed on solution grid 102 such that the edges of overlays 110a, 110b, 110c abut against, are in contact with, are adjacent and/or overlap one another.

Should the player become stumped, the player may begin resolution of another portion of the puzzle by commencing with resolution of other common clues “C<sub>c</sub>” on other overlays. The player may then attempt to place these overlays on solution grid 102 at locations where the player believes these solution fit.

According, to an alternate method, if the first Across answer does not completely fill the top row of solution grid 102, the length of the second Across answer may be determined by subtracting the number of the second Across clue from the number of the third Across clue. Therefore, as seen from FIG. 5, if the second Across clue is numbered “6” and the third Across clue is numbered “12”, then the length of the second Across answer is six (6) cells long. At such time, as seen in FIG. 12, the cells to the right of cell 126a of overlay 110a may be marked consecutively from six (6) to eleven (11). Next, the cell to the right of the cell numbered “11”, i.e., cell 136a (corresponding to the upper right-most cell of overlay 110b and/or to the upper left-most cell of overlay 110c) as seen in FIG. 12, may be blackened.

If the first and second Across answers do not completely fill the top row of solution grid 102, then the length of the third Across answer may be determined by subtracting the number of the third Across clue from the number of the fourth Across

clue. Therefore, as seen from FIG. 5, if the third Across clue is numbered “12” and the fourth Across clue is numbered “16”, then the length of the third Across answer is four (4) cells long. At such time, as seen in FIG. 12, the cells to the right of cell 136a may be marked consecutively from twelve (12) to fifteen (15). In the present example, the third  
5 Across answer completely fills the first row of solution grid 102.

Should the player believe that the puzzle contains some degree of symmetry, following resolution of all or at least a portion of the diagramless crossword puzzle corresponding to overlay 110a, another overlay 110d may be placed over overlay 110a in order to transpose the filled in cells thereof (e.g., cells 126a, 128a, 130a, 132a and 134a)  
10 to overlay 110d. If the, diagramless crossword puzzles is symmetrical (i.e., the blackened cells are in the same relative location on solution grid 102 when solution grid 102 is right-side up and upside down).

With blackened cells 126a-134a of overlay 110a transposed onto overlay 110d, as seen in FIG. 13, overlay 110d is rotated 180° and placed on the lower right-most portion  
15 of solution grid 102. In particular, when overlay 110d is in position over overlay 110a, an upper-most edge of overlay 110d is aligned with an upper-most edge 102a of solution grid 102 and a left-most edge of overlay 110d is aligned with a left-most edge 102b of solution grid 102. When overlay 110d is placed on the lower right-most portion of solution grid 102, the upper-most edge of overlay 110d is aligned with a lower-most edge  
20 102c of solution grid 102 and the left-most edge of overlay 110d is aligned with a right-most edge 102d of solution grid 102.

This process is repeated for each of overlays 110b and 110c such that a lower portion of solution grid 102 is covered with new overlays (not shown) corresponding to



overlays 110b, 110c (i.e., the filled-in cells of overlays 110b, 110c have been transposed to the new overlays and the new overlays rotated 180° and placed on the lower portion of solution grid 102). Preferably, this process is repeated until the entirety of solution grid 102 is covered with overlays 110.

5           Once solution grid 102 has been covered with overlays 110 and the cells of the overlays filled-in to reveal and/or otherwise define the pattern of the diagramless crossword puzzle, the diagramless crossword puzzle may be completed like a normal crossword puzzle.

As seen in FIG. 14, a system for completing a diagramless crossword puzzle,  
10       which is in the form of a kit, is generally designated as 200. Kit 200 includes at least one solution grid 202 (each solution grid 202 being substantially similar to solution grid 102), a plurality of overlays 210 preferably provided in a stack 212 (stack 212 of overlays 210 being substantially similar to stack 112 of overlays 110), and a set of instructions 220.

Instructions 220 include written and/or graphic description of the use of overlays  
15       210 with solution grids 202 for completing diagramless crossword puzzles. Preferably, instructions 220 include the method of using completion system 100, as shown and described above. In addition, instructions 220 may include various hints and tips for solving a diagramless crossword puzzle.

Kit 200 may further include a plurality of diagramless crossword puzzles  
20       compiled in a booklet or pamphlet 230 of clues and/or games. Preferably, the diagramless crossword puzzles contained in booklet 230 may vary in difficulty and size in order to provide the individual with countless hours of mind challenging entertainment and enjoyment.

Although the present disclosure has been described with respect to particular embodiments, it will be readily apparent to those having ordinary skill in the art to which it appertains that changes and modifications may be made thereto without departing from the spirit and scope of the present disclosure.